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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,681	06/23/2005	Hiromitsu Tanaka	09852/0203065-US0	8954
7278	7590	07/06/2007	EXAMINER	
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			ADDISU, SARA	
		ART UNIT		PAPER NUMBER
		3722		
		MAIL DATE	DELIVERY MODE	
		07/06/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/540,681	TANAKA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sara Addisu	3722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 23 June 2005.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-12 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-12 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 23 June 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) Paper No(s)/Mail Date. \_\_\_\_\_.  
 3) Information Disclosure Statement(s) (PTO/SB/08) 5) Notice of Informal Patent Application  
 Paper No(s)/Mail Date 6/23/05. 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

- Figures 31 and 32 should be designated by a legend such as --Prior Art-- (since they are described in the Specification, e.g. page10, lines 11 & 12 as being "conventional") because only that which is old is illustrated. See MPEP § 608.02(g).
- The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "radius of curvature "r", diameter "D" and web thickness "d"" (as claimed in claims 7 and 8) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7 and 8 recite "r", "D" and "d" which were not shown in the Drawings.

Therefore, Examiner need further clarification how Applicant is measuring these dimensions.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada (JP 2000000716A).

YAMADA teaches a radius end mill (10) having end cutting edges (16) whose rake face is formed as a single smoothly continuous curved/convex surface with the substantially arc-shaped corner cutting edge (14) ('716, figure a and abstract).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 and 9-12 rejected under 35 U.S.C. 103(a) as being unpatentable over (JP 6-218616), in view of Reynolds et al. (USP 5,855,458).

Regarding claims 1 and 9, JP ('616) teaches a radiused end mill having helically twisted chip discharge flutes (12) with a twist angle ( $\alpha$ ), corner cutting edges (19), main gash faces (18e) having an inclination, said main gash faces formed on inner circumferential sides of distal end portions of wall surfaces (13) of the chip discharge flutes (15) that face in a direction of rotation of the tool, the end cutting edges (17)

formed on a distal end of the main gash faces; and an inclined sub gash faces (18f) formed on an outer circumferential side of the main gash faces such that they extend away via a step portion (18g) from the main gash faces (18e) ('616, figures 1-4). Regarding claims 2 and 10, JP ('616) teaches another embodiment where the step portion (18i) has an inclined surface ('616, figure 4). Regarding claims 4 and 12, JP ('616) teaches step portion (18g) having a concave curve). Regarding claims 3 and 11, JP ('616) discloses the claimed invention (i.e. an inclined step portion, 18i) except for the angle of inclination being between 30-60 degrees. It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the angle of inclination as a matter of design choice because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Applicant should further note that Specification gives no criticality to the claimed limitation (see Page 17, lines 14-17).

However, JP ('616) fails to teach the main gash faces having angle of inclination with respect to the axis that is a smaller angle than a twist angle of the chip discharge flutes. JP ('616) also fails to teach the sub gash faces having an angle of inclination with respect to the axis that has been made greater than that of the main gash faces.

REYNOLDS ET AL. teaches a rotary cutter having flutes (5), first (main) gash face (8) and second (sub) gash face (10) ('458, figures 1-3). Furthermore, REYNOLDS ET AL. teaches the flutes having a 45 degree twist angle, the first/main gash having a 3 degree angle of inclination with respect to the axis and the second/sub gash having a 30 degree angle of inclination with respect to the axis ('458, figures 1 and 2 & col. 2,

lines 20-38). Therefore, first/main gash is smaller than the twist angle (i.e. 3 degrees < 45 degrees) and the second/sub gash is larger than the first/main gash (i.e. 30 degrees > 3 degrees).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify JP ('616) such that the main gash is smaller than the twist angle and the sub gash is larger than the main gash, as taught by REYNOLDS ET AL. for the purpose of enabling the cutter to be used at high rotational speeds (e.g. 30,0000 rpm) ('458, col. 2, lines 32-41).

4. Claims 7 and 8, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada (JP 2000000716A).

YAMADA discloses the claimed invention (i.e. radius end mill with a diameter having an arc-shaped corner cutting edge and an end cutting edge) except for the ratio between the radius of curvature of the arc-shaped portion and the diameter of the tool body to be set at 0.2 or more or  $(D-d)/2$  or more. It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the value of the radius of curvature of the arc-shaped portion as well as the diameter of the tool body and web thickness depending on the size of the tool, material of the workpiece being cut and the finishing of the cut desired, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sara Addisu at (571) 272-6082. The examiner can normally be reached on 8:30 am - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on (571) 272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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6/21/07

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